REMARKS

As amended, claims 1, 3-6, and 8-36 are pending in the Pending Application. Claim 1 has been amended for the sake of clarity and not for the purpose of patentability. Claims 1, 3-6, and 8-36 stand rejected.

A. Rejection of Claims 1, 3-6, and 8-36 under 35 USC 112 ¶ 1

The Examiner has rejected Claims 1, 3-6, and 8-36 under 35 USC 112, first paragraph as failing to comply with the written description. The Examiner states that the claims contain subject matter not sufficiently described in the specification. Specifically, the Examiner states that there is no support in the specification for the following recitations: (1) "dielectric encapsulation having a one-piece molded material" in claim 1; (2) "**bands** at end portions of the vacuum chamber ceramic housing are substantially free of the semi-conductive material" in claims 1, 10 and 16; and (3) "a voltage screen coupled to and disposed outside the vacuum chamber, **and forming a capacitive path with the semi-conductive material**" in claims 1, 10, 16, 23, 26-30, 33, 34 and 36 [emphasis added by the Examiner].

It is respectfully submitted that the specification provides the required description of "dielectric encapsulation having a one-piece molded material." Figure 4 shows the encapsulation 190 in a single piece.

Likewise, the specification provides the required description of "bands at end portions of the vacuum chamber ceramic housing are substantially free of the semi-conductive material." These bands are disclosed in Figure 5. In Figure 5, the outside of the vacuum chamber 110 is shown to include a semiconductor material 240 and areas (bands) at the ends of the vacuum chamber 110 that do not include the semiconductor material 240.

The specification also provides the required description of "a voltage screen coupled to and disposed outside the vacuum chamber, and forming a capacitive path with the semi-conductive material." The capacitive path is inherently disclosed in the combined teachings of Figure 5, paragraph 22, and additional paragraphs of the specification. Paragraph 22 of the specification states that "...when the contacts are separated, the semiconductive material 240 eliminates the voltage stress on the ends of the floating shield 105. Voltage screens electrically

coupled to the fixed contact 120 and movable contact 130 drive the potential on the semiconductive coating 240 to 50% of the difference between the conductive end caps of the vacuum chamber 110..." Thus, any voltage that accumulates on the floating shield 105 is reduced by the semiconductive coating 240 and the voltage screens, which requires an electrical path from the floating shield 105 to the voltage screens.

During the switching operation of the vacuum interrupter, the contacts 120, 130 are separated, which, as in any switch, causes a change in the potential between the contacts 120, 130 from zero to, theoretically, infinite. The change in potential resulting from the switching operation causes charges to collect on the floating shield 105 [Specification, paragraph 0017]. Because the semiconductor coating 240 is in physical and electrical contact with the floating shield 105 through the exposed ring 114, the charges are conducted to the semiconductor coating 104. The collection of charges in the semiconductive coating 104 results in a change in potential between the voltage screens 210, 220 and the semiconductive coating 104 because there is no physical contact between the voltage screens 210, 220 and the semiconductive coating 104. As shown in Figure 5, the voltage screens 210, 220 overlap, but do not physically contact the semiconductor material 240. Therefore, the semiconductor coating 104 and the voltage screens 210, 220 form a capacitor. A capacitive path is formed between the voltage screens 210, 220 and the semiconductor material 240 due to the change in potential between the voltage screens 210, 220 and the semiconductive coating 104. This capacitive path is a result of the current induced in the voltage screens 210, 220 by the semiconductor material 240, as governed by a basic rule of capacitors $i = C\frac{dV}{dT}$, where i=current, dV/dT = the change in voltage (potential) with time. Thus, the specification provides sufficient disclosure of a capacitive path between the semiconductor coating 104 and the voltage screens 210, 220 to one with a basic knowledge of electromagnetics.

It is therefore, respectfully requested that this rejection be withdrawn.

B. Rejection of Claims 1, 3-6, 8, 9 and 23-36 under 35 USC 103(a)

The Examiner has rejected claims 1, 3-6, 8, 9, and 23-26 under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 5,597,992 to Walker ("**Walker**"), in view of U.S. Patent

No. 4,002,867 to Cherry ("**Cherry**"), and U.S. Patent No. 4,698,469 to Pham ("**Pham**"). Specifically, the Examiner states that Walker discloses the claimed invention, except for (1) a semi-conductive material in contact with the exposed ring and disposed on a central portion of the vacuum chamber ceramic housing such that bands at the end portion of the vacuum chamber housing are substantially free of the semi-conductor material; (2) the voltage screen overlapping a portion of the semi-conductor material; and (3) the first and second voltage screens disposed outside the housing. The Examiner further states that it would have been obvious to connect the exposed ring in Walker to the outside semi-conductive coating suggested by Cherry, so that the floating shield voltage could be quickly discharged. The Examiner also states that it would have been obvious to place the voltage screens of Walker in view of Cherry outside the housing as suggested by Pham to reduce the size of the housing.

It is respectfully submitted that the Examiner has failed to establish a prima facie case of obviousness because he has failed to show (1) that the cited references teach every limitation of the rejected claims, and (2) a motivation to combine the cited references. "To establish a *prima facie* case of obviousness, ... there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings...[and] the prior art reference (or references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination ... must... be found in the prior art, and not based on applicant's disclosure." M.P.E.P. § 2142 *citing In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991).

The Examiner has failed to show that the cited references teach or suggest (a) a first and second voltage screen disposed outside the housing of the vacuum chamber, as recited in all the pending claims; (b) a semi-conductive material disposed on a central exterior portion of the vacuum chamber ceramic housing such that bands of the vacuum chamber ceramic housing are substantially free of the semi-conductive material, as recited in all pending claims; (c) a first and second voltage screen overlapping a portion of the semi-conductive material, as recited in claim 1; and (d) a capacitive path formed between the first and second voltage screen and the semi-conductive material, as recited in all the pending claims.

Walker teaches a vacuum interrupter that includes several shields within a vacuum chamber. Specifically, the vacuum interrupter of Walker includes a central metallic shield 46

(Walker, column 4, lines 50-67, and Figure 1), an upper internal end shield 50, and a lower internal end shield 52 (Walker, column 5, lines 1-11, and Figure 1). These shields are all located inside the vacuum chamber for the purpose of intercepting metallic particles that are liberated from the contacts 30, 32 by arcing (Walker, column 5, lines 12-20). Cherry also discloses a vacuum interrupter that includes a central shield 22, and end (condensing) shields 6, 15 inside a vacuum chamber (Cherry, column 2, lines 36-41, and Figure 1). Just as in Walker, the Cherry shields 22, 6, and 15, are located inside the vacuum chamber for the purpose of protecting the inside of the vacuum chamber from metallic vapor (Cherry, column 2, lines 36-41, and Figure 1). Therefore, neither Walker nor Cherry teaches a first and second voltage screen disposed outside of a vacuum chamber.

In addition, the Examiner admits that Walker does not disclose a semi-conductive material in contact with the exposed ring and disposed on a central portion of the vacuum chamber ceramic housing such that bands at the end portion of the vacuum chamber housing are substantially free of the semi-conductor material. Cherry discloses a semiconductor material on the inside or outside of the vacuum chamber that creates a resistive path from shield 22 to one or both of the shields 6, 15 via contact structures 2 and 3, respectively, and support rods 4 and 10, respectively (column 2-3, lines 67-68 and 1-8, respectively, and Figure 8). The semiconductor material in Cherry is continuous on the outside or inside of the vacuum chamber in order to form the resistive path.

In addition, because the semiconductor material in Cherry forms a direct, physical (resistive) path between shield 22 and shields 6, 15, the semiconductor material does not form a capacitive path with a voltage shield, as recited in all the pending claims.

Further, the Examiner has failed to show a motivation to combine the cited references in the manner suggested by the Examiner because Cherry explicitly teaches away from using a floating shield. Cherry teaches that floating shields are "vulnerable to transient charging affects which put the shield 22 at a higher than normal voltage from which it cannot easily recover...[D]uring the post arc recovery period the shield 22 may be locked in at an abnormally high voltage which it cannot quickly discharge." (Cherry, column 2, lines 51-66). "Since the shield 22 is electrically isolated its leakage is extremely low and the time to restore the shield 22 to normal potential will require many cycles. During this time the shield 22 will be at high voltage and voltage breakdown may occur." (Cherry, column 3, lines 51-55). Cherry presents a

solution to this problem, which inserts "preselected resistances between the center condensing shield 22 and either or both electrodes, or contacts 2, 3 in the vacuum interrupter 1. This may be done by a number of different ways such as:... [b]y the use of ... semiconductors on the inside an/or outside surfaces of the insulator casing." (Cherry, column 4, lines 27-41). "Such an arrangement... will avoid the condition of a "floating" condensing shield, and will result in predictable potential maintained on the shield 22." (Cherry, column 4, lines 51-54). Because Cherry explicitly teaches away from using a floating shield, there is no motivation for one of ordinary skill in the art to combine the references as suggested by the Examiner.

Phan discloses a circuit breaker, which includes a sealed enclosure 123 that houses a fixed and moving assembly and gas under pressure. Referring to Figure 5, the circuit breaker includes volumes 123, 160, an insulating envelop 144 and cylinders 135, 146. The insulating envelop 144 and cylinders 135, 146 serve as mechanical, pressure separating walls. [Pham, column 6, lines 24-28]. Thus, cylinders 135, 146 are not voltage shields as asserted by the Examiner, but serve to separate the pressures in volumes 123, 160. Further, the cylinders 135, 146 are not located outside a housing of a vacuum chamber, but are inside a sealed enclosure. Thus, Pham does not teach the limitations lacking in Walker and Cherry.

For the foregoing reasons, it is respectfully requested that the rejection be withdrawn.

C. Rejection of Claims 10-22 Under 35 USC 103(a)

The Examiner has rejected claims 10-22 under 35 U.S.C. § 103(a) as being unpatentable over Walker, in view of Cherry and Pham, further in view of U.S. Patent No. 4,618,749 to Bohme ("**Bohme**"). Specifically, the Examiner states that Walker, Cherry and Pham satisfy the limitations of claims 10 and 16, except for the first and second voltage screens disposed within the shielded encapsulation, which, the Examiner states, is disclosed by Bohme. The Examiner further states that it would have been obvious to one of ordinary skill in the art to provide voltage screens within shielded encapsulation as suggested by Bohme to provide better waste heat conduction.

Independent claims 10 and 16 recite: (1) a semiconductor material on the exterior central portion of the vacuum chamber such that bands at exterior end portions of the vacuum chamber are substantially free of the semiconductive material; (2) voltage screens exterior to the vacuum

chamber and forming a capacitive path with the semi-conductor material, and (3) a floating shield. Therefore, the arguments previously presented in connection with the rejection of claims 1, 3-6, 8, 9, and 23-26 are applied to the rejection of claims 10-22 as well. In addition, Bohme does not teach the elements of claims 10-22 missing from Walker, Cherry, and Pham, or the motivation to combine the cited references as suggested by the Examiner. Therefore, it is respectfully requested that the rejection of claims 10-22 be withdrawn.

Conclusion

In view of the amendments and remarks set forth in this Amendment and Response to Office Action, it is respectfully submitted that the Pending Application, including claims 1, 3-6, and 8-36, is in condition for allowance. Therefore, it is respectfully requested that the foregoing amendments be entered, and the Pending Application be allowed.

The Examiner is invited to contact the undersigned if such contact would in any way facilitate and expedite the prosecution of this application.

Respectfully submitted,

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